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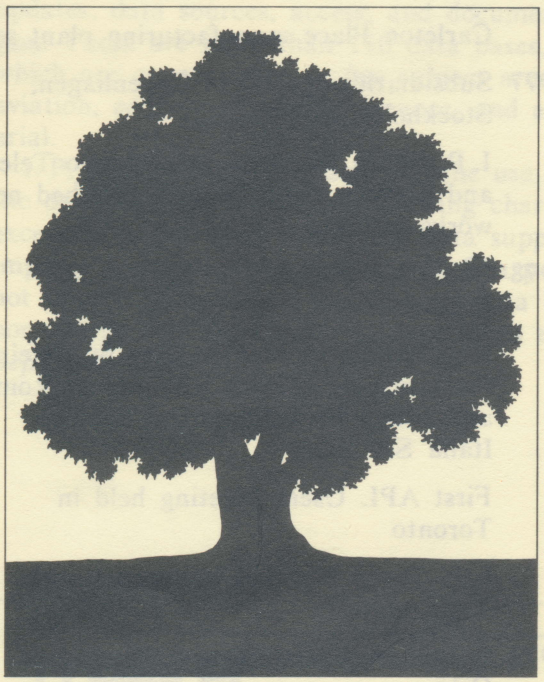
I.P. Sharp newsletter



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I. P. Sharp Celebrates Twentieth Anniversary

December 4, 1984 marks the twentieth anniversary since the founding of I. P. Sharp Associates. Headquartered in Toronto, the company has expanded to become an international organization offering a comprehensive range of computer systems and services world wide. Exports now account for over 60 per cent of the company's business. I. P. Sharp Associates has wholly owned subsidiaries in Australia, Austria, Belgium, Denmark, France, the Federal Republic of Germany, Hong Kong, Italy, The Netherlands, Norway, Singapore, Sweden, Switzerland, the United States, and the United Kingdom; and has representative agencies in Finland, Italy, Mexico, Korea and Japan. The U.K. subsidiary has offices in England, Ireland and Spain.

I. P. Sharp Associates has enjoyed rapid growth in its first 20 years. This can be attributed to the development of SHARP APL as a high-performance timesharing system, to the extent and reliability of the I. P. Sharp Network, to the company's responsiveness to the changing demands of business and industry, and to the dedication of its personnel to providing a high level of service to an ever-growing clientele.

We'd like to take this opportunity to thank our customers for their continued support, and we look forward to working together in 1985.

Now turn the page and read about some of the milestones in the company's history.

... 20th Anniversary

Company Milestones

1964 Ian Sharp and seven colleagues formed the software company, I. P. Sharp Associates

1965 Roger Moore started on the implementation of APL\360 at IBM Research in Yorktown Heights

1967 Headquarters moved up 43 floors to the 42nd floor of the Toronto-Dominion Centre

1969 Timesharing services established

Manufacturing division established in Carleton Place, Canada

1970 Dutch subsidiary, InterSystems BV, established in Amsterdam

Toronto Stock Exchange became the first data base available from I. P. Sharp

1971 IBM System/370 Model 145 installed in the Data Centre at 74 Victoria Street, Toronto

Electronic messaging facility, MAILBOX, first used

1973 Subsidiaries established in Rochester, New York, and London, England

Special Systems Division established in Toronto

First trans-Atlantic communications line installed to London

Air Traffic Control System installed at Schiphol Airport, Amsterdam

Second IBM System/370 Model 145 installed

1974 Joint venture with Sligos, Paris, established APL Europa with an office in Brussels

International headquarters moved to York Centre, Toronto

Timesharing service marketed under trade name SHARP APL

Offices located in 18 cities in five countries

1976 Private packet-switched network installed with 47 cities on the network

Subsidiaries opened in Zurich and Düsseldorf

Xerox Corporation in Rochester became the first SHARP APL in-house site

Carleton Place manufacturing plant sold

1977 Subsidiaries opened in Copenhagen, Stockholm, and Vienna

I. P. Sharp Network gateways to Telenet and Tymnet public packet-switched networks installed

1978 Subsidiaries opened in Sydney and Brussels

Represented in Mexico City by Teleinformatica de Mexico SA, and in Rome and Milan by Informatical Society Italia Srl

First APL Users Meeting held in Toronto

I. P. Sharp Network connected with Telex network

1979 Subsidiaries established in Paris and Oslo

1981 Far East expansion with subsidiary in Hong Kong and joint venture with Singapore Airlines to form Singapore International Software Services

Office opened in Madrid

International headquarters moved to Exchange Tower, Toronto

1982 Agreements with Intec of Tokyo and Daewoo of Seoul to market and distribute SHARP APL in Japan and Korea

Represented in Helsinki by TMT-Team Oy

Office opened in Dublin

1983 Joint venture with McGraw-Hill to market Electronic Markets and Information Systems (EMIS)

Global Information Centre introduced

. . . 20th Anniversary

1984 Offices located in 55 cities in 22 countries

Over 600 cities have local access to IPSANET in 47 countries

Over 40 SHARP APL in-house sites

More than 120 public data bases available ■

SHARP APL for the IBM Personal Computer XT/370

I. P. Sharp Associates has announced the release of SHARP APL for the IBM Personal Computer XT/370. SHARP APL/PCX is now available for purchase.

SHARP APL/PCX provides complete micro-mainframe compatability taking full advantage of increased processing speed and hardware emulation capabilities of the XT/370. The system operates directly under PCDOS; the IBM VM/PC operating system is not required, which results in significant savings.

The SHARP APL/PCX system includes:

- SHARP APL interpreter
- Session manager
- File system
- Shared variable processor
- Three auxiliary processors
- Utility software

The price of a single system is US$2,500 (or its equivalent in local currency; CDN$3,250) with pricing also available for local area networks.

Each copy of SHARP APL/PCX includes:

- Two diskettes containing the system
- *SHARP APL Pocket Reference*
- *SHARP APL/PCX Handbook*, which describes the system for both the beginning user and the application programmer
- APL stickers for the Personal Computer's keybuttons
- APL Character ROM which enables an IBM Personal Computer XT/370 to display APL characters

In the future, I. P. Sharp plans to release a product which will provide a local System/370 environment for the complete family of IBM Personal Computers, including the XT/370. Plans also include the release of industry specific application software products for the XT/370.

For further information on I. P. Sharp's new software for the XT/370, contact your I. P. Sharp representative or Jim Royer, Manager of Microcomputer Products, at international headquarters in Toronto. ■

Compu Trac Data Collection for the IBM PC and Apple II

Compu Trac is a specialized, micro-based analysis package for following stock and commodity market trends and patterns. It contains a variety of studies and charting techniques. Several thousand technical analysts have purchased the system, making it the most successful of its kind in the world. One reason for its success is that the creators of the package, The Technical Analysis Group, actively participate in the stock and commodity markets. They also sell and support the package.

The Compu Trac package does not tell you when to buy or sell a commodity or stock; but it can pinpoint specific market conditions which may favourably affect a buy/sell decision. As a typical user, you might actively be following 20 stocks or commodities. Each day, you would perform your analyses after adding the most recent information (such as high, low, close and volume) to the history you have previously collected on your data diskettes.

Building your data base

I. P. Sharp Associates now provides an accurate, reliable way to build and update your data base on a microcomputer, using the public data bases of the I. P. Sharp Information Network. The I. P. Sharp service offers several

... Compu Trac Data Collection

advantages, including:

- accurate historical information from the world's largest collection of stock and commodity trading statistics
- timely daily updates
- toll-free local access from over 600 locations around the world
- economic pricing (at INFOMAGIC rates)
- no monthly minimum fee and no data surcharge for pricing data bases

All data transfer is checked for errors and I. P. Sharp's data collection program automatically asks for a resend of any data that was transmitted incorrectly.

The program supports both diskette and hard-disk systems. Other features include history collection for one stock at a time, automatic signing on to the I. P. Sharp Online Service, and loading of the associated software (on the I. P. Sharp computer).

In addition, the program for the IBM PC is completely menu-driven and includes access to INFOMAGIC, which has an electronic mail option.

To collect data you only need to build a "portfolio" of all the items you wish to collect together at a certain time. Most symbols used to specify financial items are based on the trading symbol used by the exchange wherever it trades.

Once you have collected the required amount of historical data for each file, you disconnect from the I. P. Sharp Online Service. Then you apply a full range of Compu Trac analysis techniques, called "studies", which include moving averages, demand index, commodity channel index, Hal momentum index, Haurlan index and many others.

For more information about Compu Trac, contact your I. P. Sharp representative or:

Steve Fant
The Technical Analysis Group
1021 Ninth Street
New Orleans, Louisiana 70175
Telephone: 504 895–1474 ■

Tracking Sweden's Export Markets

The volume of world trade is close to $2-trillion annually and it's rising. As competition in world markets intensifies, countries must develop a marketing strategy and be more selective about where to concentrate their marketing efforts. Sweden is in a particularly good position to get its share of the market with the Swedish Trade Council (STC) coordinating the country's promotion of exports.

Of the 500 people employed by this semi-governmental organization, more than 300 work in 32 trade offices around the world. Unlike export promotion organizations in general, STC acts more like a consulting firm in international marketing, rather than being part of the Swedish government administration.

In promoting exports, STC employees must not only have a thorough knowledge of what products and services their country can offer, but they must also be able to find the best export markets for these products and services. Although it is simply a question of supply and demand, until recently it had been difficult to locate those specialized export markets. Now the Swedish Trade Council is well equipped to assist Swedish exporters with the use of the United Nations Commodity Trade Statistics, from I. P. Sharp's library of public data bases.

Analysing trade statistics

Since STC acts as a market analyst for companies operating internationally, it has always been involved with the analysis of trade statistics. Until it started using the United Nations data base, collecting information from many different sources had been a time-consuming process. After the data was collected, it had to be translated into uniform currencies and volumes. Finally, someone had to calculate, edit, and type the tables. A manual procedure is adequate when tracking a very limited number of products or markets. But STC was analysing market sizes, potential market shares, and future trends for all markets and countries.

As part of the job, STC personnel are asked many of the same questions over and over again, for example:

- Which geographical markets should a par-

ticular producer/exporter or groups of companies within a specific business sector direct their marketing activities to?
- Which markets are the main importers of a specific product category?
- Which product area in a country's total imports shows the highest growth rate over the last five-year period?

Since STC had been using I. P. Sharp public data bases for several years, in the fall of 1982, it asked I. P. Sharp Associates whether there were any new data bases in the pipeline covering export/import figures down to a very detailed level. At that time, the United Nations Statistical Office (UNSO) in New York had only distributed trade information on tape to various official bodies, such as the World Bank. In 1983, the UNSO decided to market the data, making it possible for companies like I. P. Sharp to buy the entire contents of the United Nations Commodity Trade Statistics (SITC) data base.

Using the SITC data base

Early in 1983, STC developed a set of tables corresponding to the various types of frequently-asked questions on international trade that had been very difficult or almost impossible to answer manually. Then I. P. Sharp's office in Sweden wrote custom software to be used with the SITC data base to provide an easy way to analyse an individual company's position in the international marketplace.

The software and data base have also proven to be an excellent tool for use in the planning process for the Swedish Trade Council itself. For example, the Swedish trade commissioner in Paris can easily and instantly analyse Sweden's penetration into the French market, or where Swedish exporters lost market shares. He can also determine if there are some product areas showing high growth rates, or which product areas are of interest and their importance to Swedish companies. STC can trace the fast growing sectors in the country's imports as well as emerging competition from new, previously not represented countries.

Sweden is highly dependent on world trade. Like other industrialized nations, Sweden's domestic market cannot create a large enough demand for all its goods and services and, added to this, the population is not growing. To maintain economic growth, Sweden must look beyond its borders to trade world wide. Now it has a competitive edge with the organization, the staff and the tools. ■

Bengt Rubin, Stockholm

United Nations Commodity Trade Statistics Data Base

The U.N. Commodity Trade Statistics (SITC) data base contains international trade statistics as reported by 31 major trading countries. It has details on trade with 270 countries and country groupings, and for over 3,000 commodities as coded by the U.N.'s Standard International Trade Classification (SITC), Revision 2. The data includes trading partners, type of trade, value in U.S. dollars, and quantity traded. The 270 countries and country groupings represent possible trading partners for each reporting country. To see the list of countries:

```
)LOAD 39 MAGIC
SITC 'AVAIL'
```

The Development of the Market Analysis System

The Australian Department of Trade is responsible for the maintenance of Australia's position as a major trading nation. In order to perform its role, the Department must have a comprehensive understanding of world trade patterns.

As a result of depressed trading conditions for Australia's traditional commodity exports and the increasing trade barriers being applied to such exports, the Department decided to strengthen efforts to promote Australian manufactured exports.

. . . Market Analysis System

The new emphasis on manufactured goods altered the Department's data requirements. While hardcopy records and semimanual techniques are satisfactory for analysing the 30 or so major commodities that comprise about three-quarters of Australia's exports, they were not satisfactory for analysing the far greater number of manufactured goods (1,750 at the United Nation's Standard International Trade Classification (five-digit level). Clearly a computer data base of trade flows and appropriate analytical software were required.

After some investigation, the Department discovered that I. P. Sharp Associates maintained a large proportion of the United Nations trade data base. They examined the data base, and considered it acceptable for the Department's purpose.

However, the use of I. P. Sharp's SITC access function in 39 *MAGIC* to retrieve and manipulate this data was not considered appropriate in this application. It did not take into account the way the Department would use the data.

Designing custom software

Discussions between the Department of Trade and I. P. Sharp's Canberra office were then initiated. As a result of those discussions, a specification was drawn up for a new retrieval package, which was then written by I. P. Sharp.

The central feature of this package is that it provides for user-defined selection criteria to be easily specified. These criteria relate to the value, change in value, or rank of the data specified by the parameters (viz. *REPORTER*, *PARTNER*, etc.). Criteria once selected remain in effect until changed by a new specification command. The new retrieval package in the public workspace 539 *SITC* is fully linked to MAGIC and SUPERPLOT and incorporates the enhancements to the retrieval specification software. Finally, the package was constructed such that the retrieval was conducted as an N-task, although specification of the retrieval remained a T-task. This has resulted in a considerable cost saving.

The Market Analysis System, as it is called by the Australian Department of Trade, has proved to be successful and has been useful for market research work. ■

Denis Taylor, Assistant Secretary, Department of Trade, Canberra

Workspace 539 *SITC*

The Market Analysis System developed in association with the Australian Department of Trade is now available for public use on the I. P. Sharp Online Service through the workspace 539 *SITC*. This workspace has been designed to facilitate analysis of world trade patterns using data contained in the United Nations Commodity Trade Statistics (SITC) data base. It offers all the advantages of data manipulation and reporting using I. P. Sharp's MAGIC, but extends the data selection process by offering filtering on traded value and growth rate. Other special features available in 539 *SITC* include enhanced automatic labelling, sorted output, reporting of growth rates, and a simplified retrieval syntax.

The commands *REPORTER*, *PARTNER*, *COMMODITY*, and *TYPE* are used to identify the set of trade flows of interest. These trade flows can then be screened by specifying a filter to select only those series satisfying a given constraint or combination of constraints. Filters begin with the keyword *FIND* and are constructed using relation codes and conjuctions similiar to those available in INFOMAGIC.

In 539 *SITC* the filter and value of *REPORTER*, *COMMODITY*, and *TYPE* remain current until respecified. This simplifies the process of analysing trade patterns by allowing sequences of related retrievals to be performed with a minimum of commands. Using 539 *SITC*, it is just as easy to screen partners to analyse the origin and destination of trade in specific commodities.

For a more detailed explanation of the facilities for trade market analysis, type *DESCRIBE* in the workspace 539 *SITC*.

Glen D'Este, Canberra

New Data Bases Update

Here are highlights of recently announced data bases on the I. P. Sharp Information Network. For more details, contact your nearest branch office.

Energy

Chemical Market Associates Petrochemical Market Reports (CMAI)

Contains three analytical petrochemical reports issued monthly: *The C4 Market Report*, *The Monomers Market Report*, and the *Fibers Intermediate Market Report*. Each focuses upon a critical dimension of the petrochemical market place and provides textual commentary on current developments and future prospects, as well as numeric forecasts of emerging trends. Reports vary in length, averaging five to seven pages of text plus two pages of tables.

Economics

Country Economic Profiles (CEP)

Presents relevant economic data for 123 countries in consistent format, facilitating comparative study of economic performance between countries in three main categories, i.e. developed, developing and centrally planned economy. Each profile is based on reliable statistics publicly available from international agencies such as the World Bank, United Nations, International Monetary Fund, and the Organisation for Economic Co-operation and Development, as well as local sources such as the Australian Bureau of Statistics, United Kingdom Central Statistical Office, and Statistics Canada.

Organisation for Economic Co-operation and Development Indicators of Industrial Activity (OECDIIA)

Provides a detailed look at the economic developments in different industries for 24 countries and country groupings. Contains indices for industrial production, deliveries, new orders, unfilled orders, producer prices and employment for each of over 30 industrial groupings, classified according to the International Standard Industrial Classification (ISIC). These monthly, quarterly and annual series provide industry specialists with the means to make detailed analyses.

Financial

Duff and Phelps Equities (DPEQUITY)

Assists portfolio managers and analysts to arrive at equity investment decisions through electronic analysis and searching. Contains D&P equity research summaries on 440 individual companies, latest D&P investment recommendations on companies and industries, changes in D&P earnings and dividend estimates, D&P buy/sell lists by company and industry, and brief industry profiles on 60 sectors of the U.S. economy.

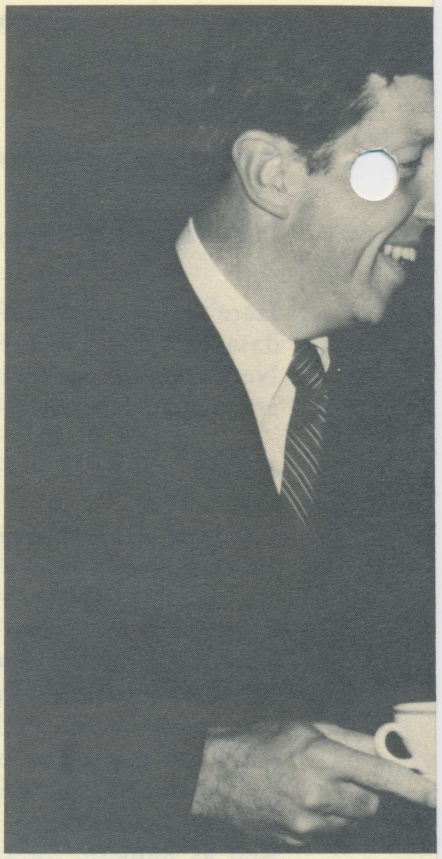
News

EDITEUR and FORMATIC

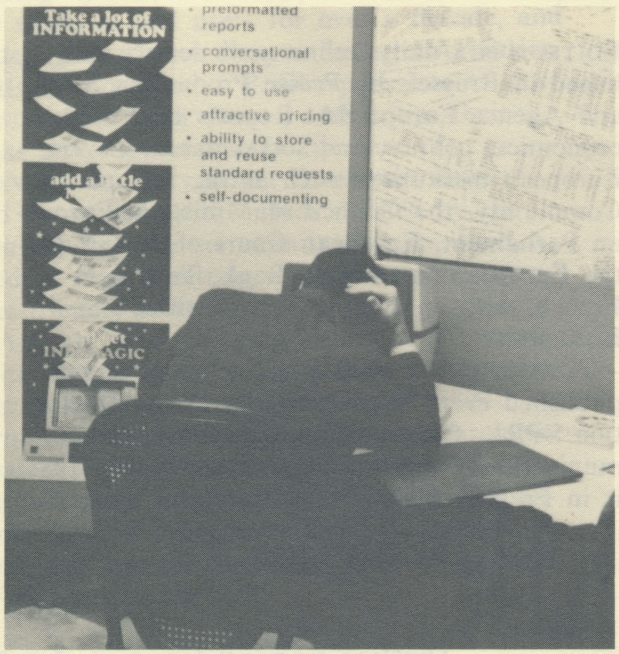
EDITEUR is a daily online news service published in Brussels by Presse Production SPRL and Agence Europe SA. Reports on European economics, politics, and social issues. Covers European institutions such as the European Community, the Council of Ministers, European Parliament, European Court of Justice and the European Investment Bank. Text is in French, with an English version titled EUREDIT.

FORMATIC is a weekly online news service published every Wednesday by Presse Production SPRL. Covers computers and telecommunications from a European viewpoint. Text is in French. ■

James Martin, Chairman of James Martin Associates, a worldwide consulting group, is a world-renowned consultant, lecturer and author. He entertained and amazed the audience with his comprehensive survey of technology, and his ability to put into perspective the history and future of the computing industry.



H. Mitchell Watson, Jr. is addressing the audience at the first plenary session.


Take a lot of INFORMATION
• preformatted reports
• conversational prompts
• easy to use
• attractive pricing
• ability to store and reuse standard requests
• self-documenting

There was lots of activity on the top floor of the Westin Hotel, where the product displays and demonstrations were held. These suites were constantly busy with conference attendees getting hands-on demos of the latest products. On display were the Information Network, Microcomputers, Publications, VIEWPOINT and Global Information Centre products, electronic mail for the IBM PC, and MEGATEX.

APL
15-17
Westin

Lib Gibs
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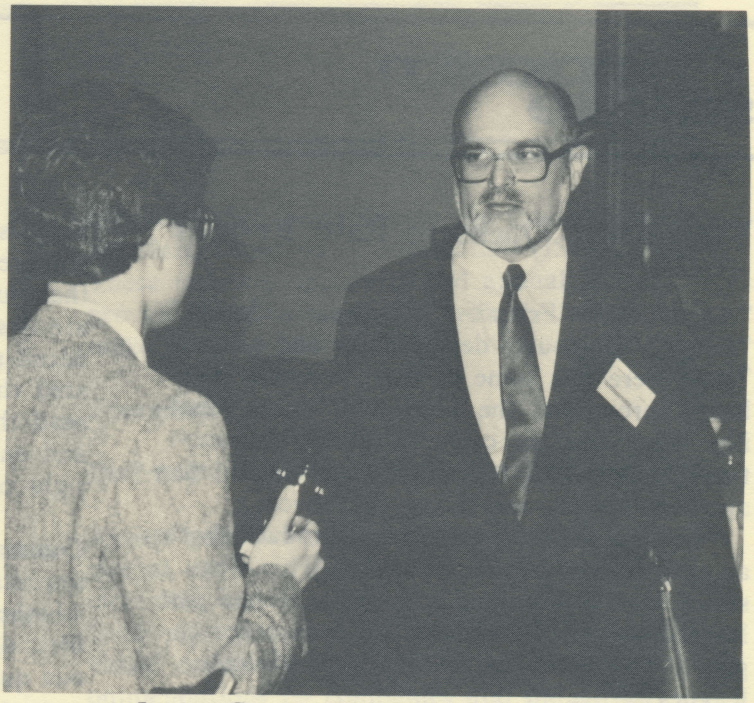
H. Mitchell Watson, Jr., IBM Vice President, and President, Systems Products Division, IBM Corporation, White Plains, New York, was the third keynote speaker. He discussed the rapid changes in computer technology, and their impact on micros through to mainframe computers. Pictured above, he is on the left with Ian Sharp during a coffee break.



James Cunnie, Director of Office Systems Planning, ITT Corporation, Stratford, Connecticut, launched the conference with his keynote address. He predicted what life would be like in the global village of the near future. Here he is after his speech, discussing his talk further with a member from the audience.

Highlights
f the 1984
Users Meeting
October 1984,
Hotel, Toronto

on, Director of Application Development, I. P. Sharp es, Toronto, in her keynote introduced I. P. Sharp's nfo tion Centre. In this ion centre, I. P. Sharp can all the technology required: mmunications and software.

VIEWPOINT Opens to Rave Reviews

"Appealing." "Friendly." "Non-intimidating." "Easy." "Obviously designed for end users." These were just some of the comments overheard throughout the 1984 APL Users Meeting. What was the cause of all this commotion? VIEWPOINT, I. P. Sharp's new data management system, was being previewed.

"Finally, a fourth-generation product that's as easy to use as you say it is." This was stated by a conference attendee who had just learned to use VIEWPOINT and was eager to give a demonstration to several of his colleagues.

Why the rave reviews?

One reason VIEWPOINT appealed to this group (most of whom represented information centres) is that information centre managers and users designed the product. As a time-sharing vendor, I. P. Sharp has been satisfying the needs of end users for over a decade, and understands the challenges facing information centres. Moreover, I. P. Sharp maintains close relationships with clients, and values their ideas and suggestions. In the case of VIEWPOINT, the product developers listened and responded to the needs defined by the information centre community. The result is a product that is setting a new standard for user-friendly software.

Another distinguishing aspect of VIEWPOINT is its design. It fully exploits the power and user-productive features of the IBM 3270 information display stations. The asynchronous version of VIEWPOINT was implemented after the fullscreen product was designed. This ensures that all users, even those in remote locations, can use the system to gain easy access to corporate data.

What features got the most acclaim?

For a fourth-generation system to be readily accepted by end users, it must first be visually and intuitively appealing. VIEWPOINT screens are easy to read, uncluttered, and have a consistent format. The screens are designed to use colour effectively, so visual appeal is further enhanced on colour devices.

Help is always available. VIEWPOINT has a comprehensive help facility that provides more than just online documentation. Help messages are designed to produce the precise level of detail required. Conference attendees appreciated the "active" help messages. They could read the help message, decide how to proceed, and enter a command or make a selection right on the help screen.

Command language. The preview audience was impressed by VIEWPOINT's ease of use—whether it was to set up their own VIEWPOINT files, define fields, input data, or perform various queries. Because the command language is consistent throughout the system, they felt at ease immediately as they moved from screen to screen and from module to module.

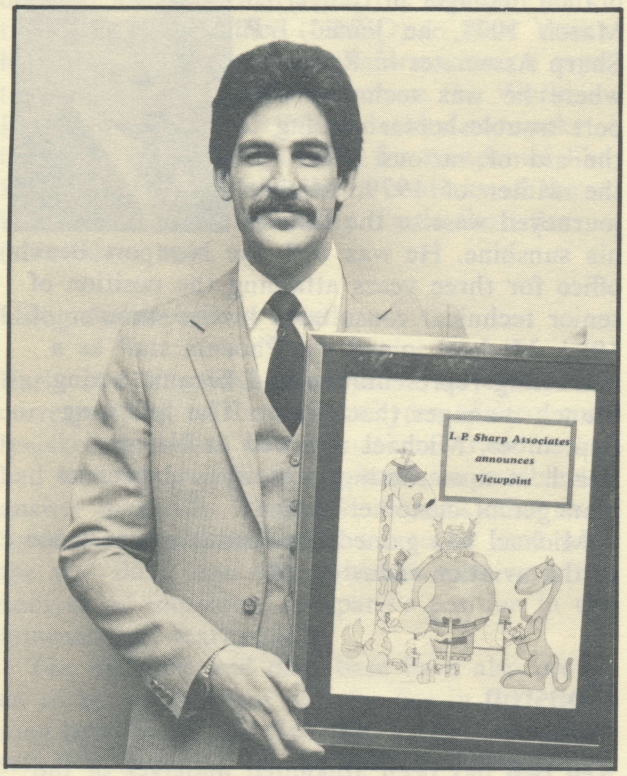
Reporting. The real applause, however, came when the conference participants saw how VIEWPOINT handles reporting. The product demonstrators began by showing how stored report definitions can be easily recalled and run. Producing "canned" or previously stored reports may be all some users ever need to do. But for those with a need to produce their own reports, VIEWPOINT has a non-procedural Report Writer language. Users can be familiar with the basic vocabulary in an hour or two, and fluent in an afternoon. To aid the learning process, a Quick Report option prompts for the input needed to produce a simple report. It then translates the responses into Report Writer statements.

Graphics. Of course, since everyone loves pictures, VIEWPOINT's plotting capabilities captivated the audience. I. P. Sharp has an enviable reputation in the area of business graphics, and that knowledge and expertise has been applied in the development of the VIEWPOINT graphics option. A user can produce a complete plot by typing one command such as BARCHART, or control every last detail if desired.

. . . VIEWPOINT Opens to Rave Reviews

Multi-language. Conference attendees from Europe were pleased that VIEWPOINT could speak more than one language. This capability is paramount for a system that is designed for a *Global* Information Centre.

Data maintenance on the PC. Demonstrations of VIEWPOINT/PC assured everyone that vertical integration had not been overlooked in the development plans for VIEWPOINT. Data downloaded from the mainframe can be cost-effectively updated and maintained using this system.



When VIEWPOINT was premiered at the Users Meeting, a cast of animal characters were there to introduce the system. Two drawings with all the characters were created especially for two attendees of the conference. The winners of the draw were Al Feder of Sears Canada Inc., Toronto, (pictured above) and Gilles Maillet of Corporation Desjardins, Montreal.

What lies ahead for VIEWPOINT?

Ambitious plans lie ahead for VIEWPOINT, many of them based on the useful feedback and comments from conference attendees.

I. P. Sharp sees VIEWPOINT as the cornerstone of a Global Information Centre; it will be the umbrella product for all end user applications. Business graphics software has been integrated into VIEWPOINT, and the same will soon be done with electronic messaging. It will then be possible to send reports and data accessed via VIEWPOINT to people world wide. This facility, made possible by I. P. Sharp's international communications network, will make VIEWPOINT unique among data management systems. Project planning, statistics, and financial planning will also be integrated into VIEWPOINT.

Currently under development is a customized workstation that will enable IBM PC users to access VIEWPOINT in the same way as if they were using a fullscreen display station, but over an asynchronous network. And, a standalone version of VIEWPOINT for the XT/370 and AT/370 devices will be available in 1985.

Interfaces to commonly used data base management systems (for example, ADABAS and IMS) are also high priorities. Many clients currently use APL interfaces to these packages. In the future, these interfaces will be simpler and integrated into the VIEWPOINT command syntax.

High-quality documentation and training materials, tailored to meet the needs of a wide variety of users, will continue to be provided.

More information

If you have an information centre, are in the process of establishing one, or if you are just concerned about productive end-user applications, you should make a point of viewing this friendly new product. For more information or for a closer look at VIEWPOINT, contact your I. P. Sharp representative. ■

Wendy Sexsmith, Toronto

Indonesia Gets Local Access to IPSANET

The I. P. Sharp Online Service is now accessible via a local telephone call in Jakarta. This link with IPSANET is provided by P. T. Indonesian Satellite Corporation (INDOSAT), the international data communications branch of the public telecommunications authority, through Tymnet.

Asynchronous terminal users can connect to TYMNET at either 30 characters per second (cps) or 120 cps. Charges for 30 cps are:

US$50 fixed monthly charge
US$15 per connect hour
US$15 per kilo segment of characters
US$10 per user id per month

For a usage agreement, or for more information, contact:

Marketing Department
P. T. Indonesian Satellite Corporation
21 Jalan Medan Merdeka Barat
Jakarta, Indonesia
Telephone: 375208 ■

New Local Access Number

Geneva

120 cps 022 45 37 20

Los Angeles

30 cps 213 556–1028
120 cps 213 556–1824

Seattle

30 cps 206 343–9069
120 cps 206 343–7290

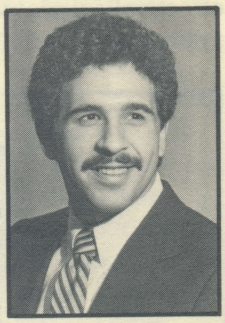
Zurich

120 cps 01 211 79 70

Chicago

Gary Mills has been appointed U.S. product manager for electronic mail and will remain based in Chicago. In this newly created position, he is responsible for the market research and promotion of electronic mail products. Gary was formerly technical manager of the Chicago office (*I. P. Sharp Newsletter*, March/April 1982). ■

Denver



Michael Allen is the new branch manager in Denver. In March 1978, he joined I. P. Sharp Associates in Rochester where he was technical support troubleshooter coming to the aid of various offices. In the winter of 1979, Michael journeyed west to the California sunshine. He was with the Newport Beach office for three years attaining the position of senior technical consultant. In the summer of 1982, Michael joined the Phoenix staff as a marketing representative and became acting branch manager that winter. The following September, Michael returned to Newport Beach in a marketing capacity and became manager of customer support.

Michael has gained considerable experience in the aviation industry. ■

Houston

Ken Bell has been appointed manager of the southern U.S. region with responsibility for offices in Dallas, Denver, Miami and Houston. He has worked in this region over the past two and a half years in several capacities, most recently as branch manager of Houston. ■

New Release of SHARP APL/370

I. P. Sharp Associates is in the final stages of preparing the latest version of SHARP APL/370: release 17.

Release 17 incorporates changes to APL's functions, operators, system functions, system variables, system commands, terminal support, and character set. Most of these changes are transparent to users of the current version of SHARP APL. Visible changes include a new timestamp format and closer validation of system commands.

For more information about release 17, see workspace `1 NEWS`, or ask your I. P. Sharp representative for a copy of the *SHARP APL Release 17 User's Guide*. A description of release 17's changes will appear in the January/February issue of the *I. P. Sharp Newsletter*.

Release 17 will be available to users of the I. P. Sharp Online Service and to SHARP APL/370 licensees early in the first quarter of 1985. ■

publications

New Workspace for *Introduction to APL*

A new public workspace `19 COURSE` is available on the I. P. Sharp Online Service for use with Kenneth E. Iverson's self-study APL course. *Introduction to APL* was published by APL Press in June 1984.

You can use this workspace in place of any of the four workspaces on the diskette which comes with the course. Thus you can study the course on a mainframe running SHARP APL, instead of an IBM PC or other microcomputer.

Each course workspace is adapted to the particular system on which it is designed to run. The `SUPPLEMENT` function provides the necessary system specific information such as keyboard layouts, error messages, and features or limitations of a particular APL implementation. The workspace `19 COURSE` also reflects system-specific features of the particular I. P. Sharp system you are using. ■

Bookends

The Information Centre and Changing Technologies *(new)*

If you weren't able to attend this year's conference in October, get your copy of the *Proceedings of the 1984 APL Users Meeting*. The papers cover such topics as Introducing and Implementing a Global Information Centre, Managing the Information Revolution, Managing and Implementing International Systems: the Human Factor, and Exploiting Networks.
October 1984, 214 pp., $10.00

A Planning System Users' Guide *(new)*

A Planning System (APS) helps you plan and control your organization's strategies and provide answers to what-if questions. APS is used for a variety of business purposes, and the way you use it depends on your particular needs. APS is designed for: the evaluation of alternate business strategies; internal analysis of corporate operations to determine product mix, manufacture vs. purchase, lease vs. buy, and similar policy decisions; project evaluation and risk analysis; sales and product forecasting; and general financial reporting for accounting and management.
June 1984, 104 pp., $8.00

SHARP APL Workspace Documentation Facility Users' Guide *(new)*

The SHARP APL Workspace Documentation Facility (WSDOC) analyses the contents and environment of a SHARP APL workspace, and produces a report of that analysis. WSDOC provides: the names of functions, variables, groups, and packages in the workspace; formatted listings of these objects; cross-reference tables that show where and how identifiers are used in the workspace; and tree structure diagrams that illustrate the hierarchical calling structure of programs.

WSDOC is useful for those writing programs or systems in SHARP APL, or wanting to analyse and report on a workspace in order to understand or use it better.
September 1984, 65 pp., $5.00

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VIEWPOINT Users' Guide *(new)*

VIEWPOINT, I. P. Sharp's information management system, gives you the power to transform your data into usable information. You can store data, and collect and organize it into informative reports and graphs. VIEWPOINT is versatile, easy to use, and efficient. With this flexible and powerful tool you can enter, change, retrieve, and report data. Since VIEWPOINT is a multi-user system, you can share your data with other users. VIEWPOINT provides a complete environment for information management, geared to suit all levels of expertise from the novice user to the application programmer. (See the VIEWPOINT article in this issue.)
November 1984, 101 pp., $8.00

VIEWPOINT/PC Users' Guide *(new)*

VIEWPOINT/PC combines the cost reduction benefits of data entry on the IBM PC with the ease of use and extensive resources of the mainframe VIEWPOINT system. VIEWPOINT/PC comprises only the data entry and update facilities of VIEWPOINT. It is not intended to stand alone as a VIEWPOINT system. However, by using VIEWPOINT/PC with the mainframe system, you benefit greatly by doing the more expensive data entry and updating on your PC. You "download" the required file onto the PC. When you have finished updating, you can "upload" the file to the mainframe. You can also store the working file on a diskette on your PC.
November 1984, 24 pp. + diskette, US$100.00

ARATE: Australian Financial Markets Data Base *(new)*

The Australian Financial Markets (ARATE) data base contains more than 100 time series of current and historical financial market rates. The *Financial Review*, the Commonwealth Trading Bank and the Reserve Bank of Australia provide the rates for such items as bank bills, certificates of deposits, treasury notes and bonds, promissory notes, semigovernment securities, and foreign exchange rates.

ARATE data is of interest to bankers, corporate financial officers, economists, and others in the finance industry. It offers comparisons for the rates of return for various financial instruments.
June 1984, 15 pp., $3.00

ASE: Australian Stock Exchanges Indices Data Base *(revised)*

The Australian Stock Exchanges Indices (ASE) data base contains daily time series of the price and accumulation indices of the Australian Stock Exchanges. The data includes over 30 indices and is updated by the Sydney Stock Exchange. The data is available from 1 January 1980, which coincides with the exchanges' revised indexation methods and index bases. In addition, the data base contains monthly time series of five principal indices, with some series going back to 1959.

This data base is of interest to financial institutions, portfolio managers, share traders and investors—in fact anyone wishing to measure performance and to compare alternative investments. Similarly, indices are used as analytical tools or barometers of business expectations by economists and governments.
September 1984, 23 pp., $3.00

Financial Data Bases Reference Guide *(revised)*

This reference guide provides all the information for quick and easy access to the 38 financial data bases available on the I. P. Sharp Information Network. The data bases are arranged alphabetically by the data base short name. The contents of each data base are described and instructions on how to access the data are given. A more detailed description can be found in the online *DESCRIBE* for each data base (the method for producing this online description is given in the individual data base reference section).
September 1984, 196 pp., $10.00

publications

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Public Data Bases Catalogue *(revised)*

This catalogue describes I. P. Sharp's public online data bases—their contents, frequency, updates, data sources, access, and documentation. There are more than 110 data bases, which are concentrated in five subject areas: aviation, economics, energy, finance, and actuarial.

I. P. Sharp does not charge for the use of the data, over its normal timesharing charges, except in a few cases where the data supplier imposes a charge. Specifically, I. P. Sharp does not impose subscription fees for any data base, nor charge for the number of data items read. *September 1984, 123 pp., no charge*

Microcomputer Products

Compu Trac Data Collection for the IBM Personal Computer *(new)*; **Compu Trac Data Collection for the Apple II Computer** *(new)*

Compu Trac is a specialized, micro-based analysis package for following stock and commodity market trends and patterns. It contains a variety of studies and charting techniques which you apply to your updated historical data base. These two new microcomputer products provide an accurate, reliable way to build and update your data base on a microcomputer, using the public data bases of the I. P. Sharp Information Network. (See the article on Compu Trac in this issue.) *Compu Trac for the IBM PC: July 1984, 53 pp. + diskette, US$100.00 in North America; Compu Trac for the Apple II: August 1984, 30 pp. + diskette, US$100.00 in North America*

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Volume 12 Number 6

I.P. Sharp newsletter

technical supplement 53

Contest 14: Approximate String Searching

String searching arises often in applications. Usually, there are two character vectors, which we will call *STRING* and *SUBSTRING*. The problem is to find all occurrences of *SUBSTRING* in *STRING*. Here's an example:

```
      'BANANA' STRINGFIND 'ANA'
2 4
```

As shown, the substring *'ANA'* begins at positions 2 and 4 of the string *'BANANA'*.

Often, either the string or substring (or both) will have been entered manually. So there is lots of room for human error. In the above example, the user might have entered *'AMA'* instead of *'ANA'*. We would like to get the same result—2 4—as we would have if the user had not made the typing error. That is, we would like to do approximate string searching.

It is known that almost all typographical errors fall into one of the following four classes: omission of a character, insertion of an extra character, changing a character, and interchanging a pair of adjacent characters. To keep things simple, in this contest we will assume that only one typographical error has been made. Precisely stated, our problem is, thus, as follows.

Call a character vector *S* "close" to a character vector *T* if one of the following is true:

1. $S \equiv T$.
2. After deleting a single character from *S*, $S \equiv T$.
3. After inserting a single character anywhere in *S*, including the beginning or the end, $S \equiv T$.
4. After replacing a single character in *S* by another character, $S \equiv T$.
5. After transposing a single pair of adjacent characters in *S*, $S \equiv T$.

Write a function *ASTRINGFIND* with syntax:

```
INDICES←STRING ASTRINGFIND SUBSTRING
```

such that (a) *INDICES* is a vector and (b) $I \in INDICES$, if and only if, *STRING*$[I+^{-}1+\iota L]$ is close to *SUBSTRING* for some $L > 0$. The function must work correctly (in origin 1) for all non-empty character vectors *STRING* and *SUBSTRING*.

Functions will be judged primarily on speed and secondarily on space consumption. Most tests will use short *SUBSTRING*s and long- or medium-length *STRING*s.

Contest entries are due by **14 February 1985**. You may mail your solution to the following address or append it to file 999 *CONTEST*14 on the I.P. Sharp Online Service.

Douglas J. Keenan
I. P. Sharp Associates Limited
265 Carling Avenue
Ottawa, Ontario
Canada K1S 2E1

If you append your solution to the file, be sure to include your name and address in the function comments.

First prize to the person who is not with I.P. Sharp Associates is the SHARP APL/PC

. . . Approximate String Searching

package. First prize to an employee is a book of the winner's choice. In honour of the contest closing date, each entrant may also receive the heart-shaped candy of his or her choice.

Good luck, and the results will be announced in a future issue. ■

Doug Keenan, Ottawa

Contest 13 Results

The challenge (as it appeared in *Technical Supplement 51*, July/August 1984) was to write a function which computed the vector *WORKDONE*, as a function of *CAPACITY* and *WORK*, satisfying the recurrence relation:

```
WORKDONE[I] ↔ CAPACITY[I]⌊(+/I↑WORK)-+/(I-1)↑WORKDONE
⍝ In origin 1
```

Many respondents chose to let ⍺ stand for *CAPACITY* and ⍵ for *WORK*. Expressed this way, the winning solution by Dave Hosier of Toronto, an independent APL consultant, was:

```
⍺-(1↓T)-¯1↓T←⌈\0,+\⍺-⍵
```

Here is a proof that Dave's function is correct. Let us use *R* for *WORKDONE*, *C* for capacity, and *W* for work. Let *R* be +*R*, *C* be +*C*, *W* be +*W*.

```
R ↔ C-(1↓T)-¯1↓T                                  ⍝Dave's solution
R-C ↔ -(1↓T)-¯1↓T                                 ⍝Shift C to other side
R-C ↔ -1↓T                                        ⍝+\ both sides
R-C ↔ -1↓⌈\0,C-W                                  ⍝Substitute for T
R-C ↔  1↓⌊\0,W-C                                  ⍝Duality of ⌊ and ⌈
(R-C)[I] ↔ (0,R-C)[I]⌊W[I]-C[I]                   ⍝Definition of ⌊\
R[I]-(0,R)[I] ↔ (C[I]-(0,C)[I])⌊W[I]-(0,R)[I]     ⍝Rearrange terms
R[I] ↔ C[I]⌊(+/I↑W)-+/(I-1)↑R                     ⍝Definition of +\
```

Doug Forkes, Toronto

The same solution was also found by Arthur Whitney of Edmonton, and by I. P. Sharp employees Gert Osterburg of Frankfurt and Scott Remborg of Calgary. Dave receives the SHARP APL/PC package; Gert receives the book of his choice. When identical solutions were received, the winner was taken to be the reply with the earliest postmark.

Correct, loop-free solutions, although somewhat less efficient, were received from Roger Hui of AEC, Wolfgang Fendt and Hans-Juergen Schloz of BASF, Robert M. Taylor of Xerox, and Rob Hodgkinson of I. P. Sharp in Sydney.

Roger Hui submitted a solution that was actually two characters shorter than Dave's:

```
⍺-T-¯1↓0,T←⌈\0⌈+\⍺-⍵
```

Unfortunately this elegant expression takes slightly longer to execute (at least in SHARP APL) because ⌈\0⌈ takes about twice as long as ⌈\0.

Prior to this contest, J. Henri Schueler of I. P. Sharp in Toronto studied this problem and generalized it considerably. Functions developed by Henri which solve the generalized problem can be found in workspace 3505291 *POOLS* on the I. P. Sharp Online Service. It is interesting to note that Henri's motivation was to solve problems in financial applications related to carrying forward negative cash flow, rather than uncompleted work. ■